

The Claims Defining the Invention are as Follows

1. An isolated polypeptide comprising:

- (i) an amino acid sequence selected from the group consisting of SEQ ID NO:2 to SEQ ID NO:22;
- (ii) an amino acid sequence which is at least 60% homologous to an amino acid sequence from (i);
- (iii) an amino acid sequence which is at least 80% identical to an amino acid sequence from (i); or
- (iv) a fragment of any of (i) to (iii) with a biological activity of the polypeptide encoded by SEQ ID NO:2.

2. An isolated polynucleotide comprising:

- (i) a nucleotide sequence encoding a polypeptide according to claim 1;
- (ii) the nucleotide sequence set out in SEQ ID NO:1;
- (iii) a nucleotide sequence corresponding to a degenerate version of the sequences defined in (i) or (ii);
- (iv) a nucleotide sequence capable of selectively hybridising to the sequences in (i) to (iii);
- (v) a nucleotide sequence complementary to any of the sequences (i) to (iv).
- (vi) a fragment of the sequence in (v) suitable for use as a primer or probe.

3. A method for preparing a polypeptide according to claim 1 comprising the steps of:

- (i) culturing a cell comprising a polynucleotide according to claim 2 (i) to (iv) operably linked to a promoter, under conditions that provide for expression of the polypeptide; and
- (ii) recovering the expressed polypeptide.

4. The method of claim 3 wherein the polypeptide is recovered using chromatography.

5. The method of claim 4 wherein the chromatography comprises the use of a Ni-chelation column and/or gel filtration.

6. A vector comprising a nucleotide sequence according to claim 2.

7. A host cell transformed or transfected with the vector according to claim 6.

8. An antibody specific for an amino acid sequence according to claim 1.

9. An antibody according to claim 8 further comprising a detectable label.

10. A method of preparing an antibody comprising the steps of:

- (i) conjugating a polypeptide according to claim 1 to a carrier protein;
- (ii) administering the conjugate of (i) and an adjuvant to an animal; and
- (iii) isolating the resulting antibody from the animal.

11. A method of screening a sample for *Brachyspira* species, including but not limited to *B. hyodysenteriae*, *B. intermedia*, *B. alvinipulli*, *B. aalborgi* and *B. pilosicoli* comprising the steps of:

- (i) contact the sample with a polynucleotide according to claim 2 (vi) under suitable hybridising conditions; and
- (ii) detecting any duplexes formed between the polynucleotide and nucleotide sequences in the sample.

12. A method according to claim 11 wherein the polynucleotide is selected from the group consisting of SEQ ID NO: 24, and SEQ ID NOs: 27 to 37.

13. A method of screening a sample for a polypeptide according to claim 1 comprising:

- (i) contacting the sample with an antibody according to claim 8 under conditions which allow for the formation of a reaction complex; and
- (ii) detecting the reaction complex.

14. A method of screening a sample for an antibody according to claim 8 comprising the steps:

- (i) contacting the sample with a polypeptide according to claim 1 under conditions which allow for the formation of a reaction complex; and
- (ii) detecting said reaction complex.

15. A kit for screening a sample for *Brachyspira* species, including but not limited to *B. hyodysenteriae*, *B. intermedia*, *B. alvinipulli*, *B. aalborgi* and *B. pilosicoli* comprising:

- (i) a polynucleotide according to claim 2 (vi); and
- (ii) means for detecting any duplexes formed between the polynucleotide and nucleotide sequences in the sample.

16. A kit for screening a sample for a polypeptide according to claim 1 comprising:

- (i) an antibody according to claim 8;
- (ii) means for detecting a reaction complex comprising the antibody.

17. A kit for screening a sample for an antibody according to claim 8 comprising:

- (i) a polypeptide according to claim 1; and
- (ii) means for detecting a reaction complex comprising the polypeptide.

18. A method of treating a disease associated with *Brachyspira* species, including but not limited to *B. hyodysenteriae*, *B. intermedia*, *B. alvinipulli*, *B. aalborgi* and *B. pilosicoli* in an animal comprising administering to the animal an effective amount of a composition selected from the group consisting of:

- (i) a composition comprising a polynucleotide sequence according to claim 2 (i) to (iv) in a form adapted to result in the expression of the polypeptide encoded by the polynucleotide;
- (ii) a polypeptide according to claim 1; or
- (iii) (i) or (ii) together with an adjuvant.

19. A method of treating a disease associated with *Brachyspira* species, including but not limited to *B. hyodysenteriae*, *B. intermedia*, *B. alvinipulli*, *B. aalborgi* and *B. pilosicoli* in an animal comprising administering to the animal an effective amount of a composition comprising a polynucleotide according to claim 2 (v).

20. A method of treating a disease according to claim 18 or 19 wherein the disease is intestinal spirochaetosis.

21. A method of immunising an animal against a disease associated with *Brachyspira* species, including but not limited to *B. hyodysenteriae*, *B. intermedia*, *B. alvinipulli*, *B. aalborgi* and *B. pilosicoli* comprising the step of administering an immunogenic amount of a composition selected from the group consisting of:

- (i) a composition comprising a polynucleotide sequence according to claim 2 (i) to (iv) in a form adapted to result in the expression of the polypeptide encoded by the polynucleotide;
- (ii) a polypeptide according to claim 1; or
- (iii) (i) or (ii) together with an adjuvant.

22. A method according to claim 21 wherein the disease is intestinal spirochaetosis.

23. A method according to any one of claims 18 to 22 wherein the animal is selected from the group consisting of: pigs, chickens, dogs, horses, cattle, sheep, fish, and humans.
24. A composition comprising a carrier and: (i) a polypeptide according to claim 1; (ii) a polynucleotide according to claim 2; or (iii) an antibody according to claim 8.
25. A kit for screening for comprising at least a polynucleotide complementary to a portion of the Bpmp-72 encoding polynucleotide sequence, a suitable container and instructions for its use.
26. The use of a polynucleotide according to claim 2 or a polypeptide according to claim 2 for the manufacture of a medicament for treating or preventing a disease associated with *Brachyspira* species, including but not limited to *B. hyodysenteriae*, *B. intermedia*, *B. alvinipulli*, *B. aalborgi* and *B. pilosicoli*.